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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,778	09/10/2003	Edward P. Barth	FIS919990263US2	5616

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International Business Machines Corporation
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EXAMINER

NOVACEK, CHRISTY L

ART UNIT PAPER NUMBER

2822

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,778

Applicant(s)

BARTH ET AL.

Examiner

Christy L. Novacek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-24, 27 and 29-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-24, 27 and 29-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/15/04.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the amendment filed May 4, 2005.

Response to Amendment

As stated in the attached interview summary, the limitations added to claim 20 overcomes the Venkatesan et al. (US 6,326,301) reference. Therefore, the rejections of claims 20-24, 27 and 29-35 as being unpatentable over Venkatesan in view of Anand are hereby withdrawn.

However, in agreeing that these limitations overcame Venkatesan, the Examiner assumed that these limitations were supported by Applicant's application. Upon closer inspection of Applicant's specification and drawings, support for these limitations cannot be found. Specifically, Figure 3 shows that the entire top surface of the fluorine-containing layer 15 is not planar, but includes sloped and horizontal top surfaces below the plane of the rest of the top surface. Additionally, there is no mention of the fluorine-containing layer having a planar top surface in the specification.

Information Disclosure Statement

The IDS filed December 15, 2004 has been considered. However, the references JP 07-094606 and KR 94-12488 have not been considered because these references are not in conformance with 37 C.F.R. 1.98(a)(2), which requires a legible copy of each foreign patent. No copies of these foreign patents have been provided to the PTO.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

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pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 20-24, 27 and 29-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant's specification and drawings fail to provide support for the limitations of the fluorine-containing layer having a substantially planar top surface. Figure 3 shows that the entire top surface of the fluorine-containing layer 15 is not planar, but includes sloped and horizontal top surfaces below the plane of the rest of the top surface. Additionally, there is no mention of the fluorine-containing layer having a planar top surface in the specification and claims as originally filed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 20-22, 24, 29 and 31-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Inohara et al. (US 5,976,972).

Regarding claim 20, Inohara discloses a substantially planar substrate (41/42),

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having underlying metal wires (42) therein, a substantially fluorine free insulating layer (44) on the substrate, having a height, and a fluorine containing insulating layer (45) having a planar top surface directly on the fluorine free insulating layer, also having a height (Fig. 24-24; col. 12, ln. 4 – col. 13, ln. 67). A metal structure (49) of at least the combined height of the fluorine free layer and the fluorine-containing layer, is formed in layers 44 and 45 and extends to the substrate (Fig. 27 and 32). The metal structure includes a line (492) and a via (491), where a bottom of the line and an upper portion of the via are contacted by the fluorine containing insulating layer (Fig. 27 and 32; col. 12, ln. 41-48).

Regarding claim 21, Inohara discloses forming a capping layer (43/54) on the substrate prior to the formation of the substantially fluorine free insulating layer (Fig. 28).

Regarding claim 22, Inohara discloses that the fluorine containing insulating layer is made of fluorinated silicon oxide (col. 13, ln. 64-67).

Regarding claim 24, Inohara discloses that the capping layer is made of silicon nitride (col. 13, ln. 64-67).

Regarding claim 27, Inohara discloses that the metal structure extends through the capping layer such that the height of the structure is greater than the heights of the fluorine free and fluorine containing insulating layers (Fig. 27 and 32).

Regarding claim 29, Inohara discloses that the metal structure is in contact with the underlying metal wires through the capping layer (Fig. 27 and 32).

Regarding claim 31, Inohara discloses that a lower portion of the via is contacted by the capping layer (Fig. 27 and 32).

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Regarding claim 32, Inohara discloses that the trench (line) has a height less than the height of the fluorine containing insulating layer (Fig. 27 and 32).

Regarding claim 33, Inohara discloses that the via has a height greater than the height of the fluorine free insulating layer (Fig. 27 and 32).

Regarding claim 34, Inohara discloses that the metal structure has a height equal to the height of the line plus the height of the via (Fig. 27 and 32).

Regarding claim 35, Inohara discloses that the height of the fluorine free insulating layer (44) is substantially less than the height of the via (Fig. 27 and 32).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christy L. Novacek whose telephone number is (571) 272-1839. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306 (571-273-8300 as of July 15, 2005).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLN
July 7, 2005



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